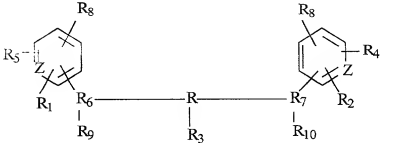
What is claimed is:

1. A method for detecting the presence or concentration of glucose in a sample which may also contain an alpha-hydroxy acid or a beta-diketone, which comprises:

a) exposing the sample to a compound having at least two recognition elements for glucose, oriented such that the interaction between the compound and glucose is more stable than the interaction between the compound and the alpha-hydroxy acid or beta-diketone, said compound also containing a detectable moiety having a detectable quality that changes in a concentration-dependent manner when said compound is exposed to glucose in said sample; and

b) measuring any change in said detectable quality to thereby determine the presence or concentration of glucose in said sample, wherein the presence of the alpha-hydroxy acid or the beta-diketone does not substantially interfere with said determination.

2. The method of claim 1, wherein the compound has the following structure:



wherein:

-R_1 and R_2 are the same or different and are selected from the following: i) hydrogen; ii) a substituent to modify the pKa and hydrolytic stability of the R_8 moiety, iii) a detectable moiety, or iv) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R_3 is hydrogen or a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R_4 and R_5 are the same or different and are selected from the following: i) hydrogen, ii) a substituent to modify the pKa and hydrolytic stability of the R_8 moiety, iii) a detectable moiety, or iv) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-each Z is independently carbon or nitrogen;

-R_6 and R_7 are the same or different and are i) linking groups having from zero to ten contiguous or branched carbon and/or heteroatoms, or ii) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R_8 is selected from the following: i) an aliphatic and/or aromatic spacer containing from 1 to 10 contiguous atoms selected from the group consisting of carbon, oxygen, nitrogen, sulfur and phosphorus, ii) a detectable moiety, or iii) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-each R_8 is the same or different and is a moiety capable of interaction with the vicinal diol groups present in glucose; and

-R_9 and R_{10} are the same or different, and are i) hydrogen, ii) a detectable moiety, iii) a group which is a) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety, and/or b) includes a functional group capable of altering the physical properties of the compound;

with the proviso that the indicator compound contains at least one detectable moiety associated therewith.

3. The method of claim 2, wherein R_8 is selected from the group consisting of boronic acid, boronate ion, arsenious acid, arsenite ion, telluric acid, tellurate ion, germanic acid, germanate ion, and combinations thereof.

4. The method of claim 3, wherein each R_8 is a boronic acid group.

5. The method of claim 2, wherein the compound comprises at least two detectable moieties that are capable of energy transport from one to the other, and wherein said energy transport is modulated by the presence of glucose in the sample.

6. The method of claim 2, wherein at least one of R, R_1, R_2, R_4, R_5, R_9 or R_{10} comprises a fluorophore moiety and further wherein at least one of those groups comprises a quenching moiety, and wherein said fluorophore is either quenched or dequenched when said compound interacts with glucose in the sample.

7. The method of claim 2, wherein the compound comprises a fluorophore, and the fluorescence of said fluorophore is modulated by the interaction of said compound with glucose.

8. The method of claim 1, wherein the sample is a physiological fluid.

9. The method of claim 8, wherein the physiological fluid is selected from the group consisting of blood, plasma, serum, interstitial fluid, cerebrospinal fluid, urine, saliva, intraocular fluid, lymph, tears, sweat, and physiological buffers.

10. The method of claim 1, wherein the compound is exposed to the sample in solution.

11. The method of claim 1, wherein the compound is immobilized on or within a solid support.

12. The method of claim 11, wherein the solid support is a polymeric matrix.

13. The method of claim 1, wherein the compound is associated with an implantable device, and wherein step a) takes place *in vivo*.

14. The method of claim 2, wherein R is an anthracene residue; R_1, R_2, R_3, R_4 and R_5 are hydrogen; R_6 and R_7 are dimethylamine residues; each R_8 is a boronic acid group; R_9 and R_{10} are aliphatic carboxylic acid residues; and each Z is carbon.

15. The method of claim 14, wherein R_9 and R_{10} are propionic acid residues.

16. The method of claim 2, wherein R is a hexamethylene residue; R_1, R_2, R_3, R_4 and R_5 are hydrogen; R_6 and R_7 are dimethylamine residues; each R_8 is a boronic acid group; R_9 is a naphthalimide residue; R_{10} is a dimethylaminobenzyl residue; and each Z is carbon.

17. The method of claim 2, wherein R is an anthracene residue; R_1, R_2, R_3, R_4 and R_5 are hydrogen; R_6 and R_7 are dimethylamine residues; each R_8 is a boronic acid group; R_9 and R_{10} are the same or different and are selected from the group consisting of a methacrylamidoalkyl residue, a methacroyloxyethoxyalkyl residue, a hydroxyethoxyalkyl residue, and an aminoalkyl residue; and each Z is carbon.

18. The method of claim 2, wherein the compound is selected from the group consisting of:

9-[N-(2-boronobenzyl)-N-[2-(2-methacroyloxyethoxy)-ethylamino]methyl]-10-[N-(2-boronobenzyl)-N-[2-(2-hydroxyethoxy)ethylamino]methyl]anthracene;

9,10-bis[N-(2-boronobenzyl)-N-[3-(propanoyl)amino]-methyl]anthracene;

9,10-bis[N-(2-boronobenzyl)-N-[3-(methacrylamido)-propylamino]methylanthracene;

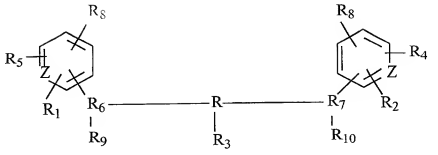
9-[N-(2-boronobenzyl)-N-[3-(methacrylamido)-propylamino]methyl]-10-[N-(2-boronobenzyl)-N-[2-(2-hydroxyethoxy)ethylamino]methyl]anthracene;

9,10-bis[N-(2-boronobenzyl)-N-[2-(2-methacroyloxyethoxy)ethylamino]methyl]anthracene; and

9,10-bis[N-(2-boronobenzyl)-N-[5-aminopentylamino]-methyl]anthracene,

and salts thereof.

19. A compound having the following structure



wherein:

-R_1 and R_2 are the same or different and are selected from the following: i) hydrogen; ii) a substituent to modify the pKa and hydrolytic stability of the R_8 moiety, iii) a detectable moiety, or iv) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R_3 is hydrogen or a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R_4 and R_5 are the same or different and are selected from the following: i) hydrogen, ii) a substituent to modify the pKa and hydrolytic stability of the R_8 moiety, iii) a detectable moiety, or iv) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-each Z is independently carbon or nitrogen;

-R_6 and R_7 are the same or different and are i) linking groups having from zero to ten contiguous or branched carbon and/or heteroatoms, or ii) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R is selected from the following: i) an aliphatic and/or aromatic spacer containing from 1 to 10 contiguous atoms selected from the group consisting of carbon, oxygen, nitrogen, sulfur and phosphorus, ii) a detectable moiety, or iii) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-each R_8 is the same or different and is an optionally protected moiety which when unprotected is capable of interaction with the vicinal diol groups present in glucose; and

-R_9 and R_{10} are the same or different, and are i) hydrogen, ii) a detectable moiety, iii) a group which is a) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety, and/or b) includes a functional group capable of altering the physical properties of the compound;

with the proviso that the indicator compound contains at least one detectable moiety associated therewith.

20. The compound of claim 19, wherein R_8 is selected from the group consisting of boronic acid, boronate ion, arsenious acid, arsenite ion, telluric acid, tellurate ion, germanic acid, germanate ion, all optionally protected, and combinations thereof.

21. The compound of claim 20, wherein each R_8 is an optionally protected boronic acid group.

22. The compound of claim 19, wherein the compound comprises a fluorophore, and the fluorescence of said

fluorophore is modulated by the interaction of said compound with glucose.

23. The compound of claim 19, wherein R is an anthracene residue; R_1, R_2, R_3, R_4 and R_5 are hydrogen; R_6 and R_7 are dimethylamine residues; each R_8 is an optionally protected boronic acid group; R_9 and R_{10} are aliphatic carboxylic acid residues; and each Z is carbon.

24. The compound of claim 23, wherein R_9 and R_{10} are propionic acid residues.

25. The compound of claim 1, wherein R is an anthracene residue; R_1, R_2, R_3, R_4 and R_5 are hydrogen; R_6 and R_7 are dimethylamine residues; each R_8 is an optionally protected boronic acid group; R_9 and R_{10} are the same or different and are selected from the group consisting of a methacrylamidoalkyl residue, a methacroyloxyethoxyalkyl residue, a hydroxyethoxyalkyl residue, and an aminoalkyl residue; and each Z is carbon.

26. The compound of claim 19, wherein the compound is selected from the group consisting of:

9-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-methacroyloxyethoxy)ethylamino]methyl]-10-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-hydroxyethoxy)ethylamino]-methyl]anthracene;

9-[N-(2-boronobenzyl)-N-[2-(2-methacroyloxyethoxy)-ethylamino]methyl]-10-[N-(2-boronobenzyl)-N-[2-(2-hydroxyethoxy)ethylamino]methyl]anthracene;

9,10-bis[N-(2-boronobenzyl)-N-[3-(propanoyl)amino]-methyl]anthracene;

9,10-bis[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[3-(methacrylamido)propylamino]methylanthracene;

9,10-bis[N-(2-boronobenzyl)-N-[3-(methacrylamido)-propylamino]methylanthracene;

9-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[3-(methacrylamido)propylamino]methyl]-10-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-hydroxyethoxy)-ethylamino]methyl]anthracene;

9-[N-(2-boronobenzyl)-N-[3-(methacrylamido)-propylamino]methyl]-10-[N-(2-boronobenzyl)-N-[2-(2-hydroxyethoxy)ethylamino]methyl]anthracene;

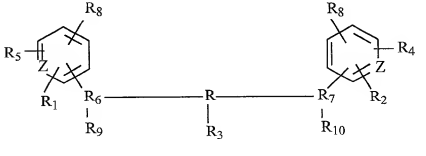
9,10-bis[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-methacroyloxyethoxy)ethylamino]methyl]anthracene;

9,10-bis[N-(2-boronobenzyl)-N-[2-(2-methacroyloxyethoxy)ethylamino]methyl]anthracene; and

9,10-bis[N-(2-boronobenzyl)-N-[5-aminopentylamino]-methyl]anthracene,

and salts thereof.

27. A detection system for detecting the presence or concentration of glucose in a sample which may also contain an alpha-hydroxy acid or a beta-diketone, which comprises a compound having the following structure



wherein:

-R_1 and R_2 are the same or different and are selected from the following: i) hydrogen; ii) a substituent to modify the pKa and hydrolytic stability of the R_8

moiety, iii) a detectable moiety, or iv) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R_3 is hydrogen or a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R_4 and R_5 are the same or different and are selected from the following: i) hydrogen, ii) a substituent to modify the pKa and hydrolytic stability of the R_8 moiety, iii) a detectable moiety, or iv) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-each Z is independently carbon or nitrogen;

-R_6 and R_7 are the same or different and are i) linking groups having from zero to ten contiguous or branched carbon and/or heteroatoms, or ii) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-R is selected from the following: i) an aliphatic and/or aromatic spacer containing from 1 to 10 contiguous atoms selected from the group consisting of carbon, oxygen, nitrogen, sulfur and phosphorus, ii) a detectable moiety, or iii) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety;

-each R_8 is the same or different and is an optionally protected moiety which when unprotected is capable of interaction with the vicinal diol groups present in glucose; and

R_9 and R_{10} are the same or different, and are i) hydrogen, ii) a detectable moiety, iii) a group which is a) a linking group capable of attachment to a solid support or a polymeric matrix, said support or matrix optionally containing a detectable moiety, and/or b) includes a functional group capable of altering the physical properties of the compound;

with the proviso that the indicator compound contains at least one detectable moiety associated therewith.

28. The detection system of claim 27, wherein R_8 is selected from the group consisting of boronic acid, boronate ion, arsenious acid, arsenite ion, telluric acid, tellurate ion, germanic acid, germanate ion, all optionally protected, and combinations thereof.

29. The detection system of claim 28, wherein each R_8 is an optionally protected boronic acid group.

30. The detection system of claim 27, wherein the compound comprises a fluorophore, and the fluorescence of said fluorophore is modulated by the interaction of said compound with glucose.

31. The detection system of claim 27, wherein R is an anthracene residue; R_1, R_2, R_3, R_4 and R_5 are hydrogen; R_6 and R_7 are dimethylamine residues; each R_8 is an optionally protected boronic acid group; R_9 and R_{10} are aliphatic carboxylic acid residues; and each Z is carbon.

32. The detection system of claim 31, wherein R_9 and R_{10} are propionic acid residues.

33. The detection system of claim 27, wherein R is an anthracene residue; R_1, R_2, R_3, R_4 and R_5 are hydrogen; R_6 and R_7 are dimethylamine residues; each R_8 is a boronic acid group; R_9 and R_{10} are the same or different and are selected from the group consisting of a methacrylamidoalkyl residue, a methacroyloxyethoxyalkyl residue, a hydroxyethoxyalkyl residue, and an aminoalkyl residue; and each Z is carbon.

34. The detection system of claim 27, wherein the compound is selected from the group consisting of:

9-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-methacroyloxyethoxy)ethylamino]methyl]-10-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-hydroxyethoxy)ethylamino]-methyl]anthracene;

9-[N-(2-boronobenzyl)-N-[2-(2-methacroyloxyethoxy)-ethylamino]methyl]-10-[N-(2-boronobenzyl)-N-[2-(2-hydroxyethoxy)ethylamino]methyl]anthracene;

9,10-bis[N-(2-boronobenzyl)-N-[3-(propanoyl)amino]-methyl]anthracene;

9,10-bis[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[3-(methacrylamido)propylamino]methylanthracene;

9,10-bis[N-(2-boronobenzyl)-N-[3-(methacrylamido)-propylamino]methylanthracene;

9-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[3-(methacrylamido)propylamino]methyl]-10-[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-hydroxyethoxy)-ethylamino]methyl]anthracene;

9-[N-(2-boronobenzyl)-N-[3-(methacrylamido)-propylamino]methyl]-10-[N-(2-boronobenzyl)-N-[2-(2-hydroxyethoxy)ethylamino]methyl]anthracene;

9,10-bis[N-[2-(5,5-dimethylborinan-2-yl)benzyl]-N-[2-(2-methacroyloxyethoxy)ethylamino]methyl]anthracene;

9,10-bis[N-(2-boronobenzyl)-N-[2-(2-methacroyloxyethoxy)ethylamino]methyl]anthracene; and

9,10-bis[N-(2-boronobenzyl)-N-[5-aminopentylamino]-methyl]anthracene,
and salts thereof.